On Equilibrium Relation between C, Si in Pig Iron and Slag under One Atomospheric Pressure of Carbon Monoxide Gas

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given rise by aging these foils at room temperature for a few days.

Moreover, the reason why the "P.R." could hardly be detected with the foils, which had been worked more severely than those displaying this phenomenon, was confirmed by the further examinations to be due to the occurrence of the "P.R." in the very midst of the procedure of rolling.

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14. On Equilibrium Relation between C, Si in Pig Iron and Slag under One Atomospheric Pressure of Carbon Monoxide Gas.

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In case of production of pig iron in blast furnace, the equilibrium relation between pig iron and slag is the most important factor. Therefore, we determined at 1400°C the equilibrium relation between C, Si in pig iron and SiO_2-CaO-Al_2O_3 system slag under one atm. pressure of carbon monoxide gas.

The carbon monoxide gas, which is produced by dropping formic acid into hot conc. sulphuric acid, previously purified, is fed into a hard porcelain tube. Together with the artificial slag and proper quantity of metalic silicon, the sample, which was prepared from a high carbon white pig iron is melted in a graphite crucible, placed in the above mentioned porcelain tube. Temperature is measured by the optical pyrometer. Now the graphite crucible is taken out from porcelain tube, and is cooled in water as soon as possible. At first, we determined the duration of time which pig and slag needed to reach the equilibrium, Next we determined the equilibrium relation between the pig and several kinds of slags.

It is found that the time when pig and slag reach the equilibrium is 2.5 hours on the first experiment, while on the next experiment we find that the higher the the basicity of slag, the larger the solubility of carbon in pig iron and the smaller the solubility of silicon in it. Thus from the above results we get the answer of the equilibrium relation between carbon and silicon in pig iron at 1400°C.

The above results are considerably different from those reported by Mr. Mukaiyama, Messrs. Koide and Otani, and Messrs. Schichtel and Piwowarsky. Some considerations on this cause have been made. Our next step is to carry out the similar experiments at 1,500°C and 1,600°C respectively, to see the influence of heat on their equilibrium relation.
